

FINAL REPORT  
JUNE 1994

REPORT NO. 94-20

STINGER MISSILE  
EXTERNAL AERIAL  
TRANSPORT (EAT)  
CERTIFICATION

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U.S. Army Armament Research, Development  
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SAVANNA, ILLINOIS 61074-9639

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20 JUN 1995

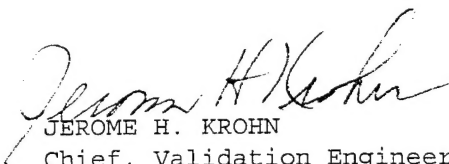
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SUBJECT: STINGER Missile External Aerial Transport (EAT) Certification

1. Enclosed is the U.S. Army Defense Ammunition Center and School (USADACS) Report No. 94-20.
2. The POC is Mr. Quinn D. Hartman, SMCAC-DEV, DSN 585-8992, commercial (815) 273-8992.

FOR THE DIRECTOR:

Encl  
as

  
JEROME H. KROHN  
Chief, Validation Engineering Division

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19. ABSTRACT (Continue on reverse if necessary and identify by block number) <p>The U.S. Army Defense Ammunition Center and School (USADACS), Validation Engineering Division (SMCAC-DEV), was tasked by the U.S. Army Armament Research, Development and Engineering Center (ARDEC) to conduct a static pull test on the STINGER missile pallet as part of the helicopter External Aerial Transport (EAT) certification process. As prescribed by MIL-STD-209, Military Standard Slings and Tiedown Provisions for Lifting and Tying Down Military Equipment, the pallet was loaded to 4,200 pounds for a period of 90 seconds utilizing a four-legged sling. The first article pallet initially tested was noted to have minor permanent deformation in the toplift frame upon completion of the test. Since no permanent deformation is allowed, the first article pallet was determined to have failed the MIL-STD-209 static pull test. A second pallet toplift frame was constructed substituting 10 gauge metal for 12 gauge metal. The lift test was repeated with the new toplift frame on the pallet. Upon completion of the test, the pallet was inspected and determined to have sustained no permanent deformation as a (continued)</p>					
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22a. NAME OF RESPONSIBLE INDIVIDUAL <b>JEROME H. KROHN</b>			22b. TELEPHONE (Include Area Code) <b>815-273-8929</b>		22c. OFFICE SYMBOL <b>SMCAC-DEV</b>

# 19. ABSTRACT (continued)

result of the static load. Having successfully passed MIL-STD-209 requirements, the STINGER missile pallet was transported to U.S. Army Combat Systems Test Activity (USACSTA) for helicopter flight testing.

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U.S. ARMY DEFENSE AMMUNITION CENTER AND SCHOOL  
VALIDATION ENGINEERING DIVISION  
SAVANNA, IL 61074-9639

REPORT NO. 94-20

STINGER MISSILE EXTERNAL AERIAL TRANSPORTATION (EAT) CERTIFICATION

JUNE 1994

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## PART 1

### INTRODUCTION

A. BACKGROUND. The U.S. Army Defense Ammunition Center and School (USADACS), Validation Engineering Division (SMCAC-DEV), was tasked by the U.S. Army Armament Research, Development and Engineering Center (ARDEC) to conduct a static pull test on the STINGER missile pallet as part of the helicopter External Aerial Transport (EAT) certification process. Testing was conducted IAW MIL-STD-209, Military Standard Slings and Tiedown Provisions for Lifting and Tying Down Military Equipment.

B. AUTHORITY. The test was accomplished IAW mission responsibilities delegated by the U.S. Army Armament, Munitions and Chemical Command (AMCCOM), Rock Island, Illinois. Reference is made to the following:

1. Change 4, 4 October 1974, to AR740-1, 23 April 1973, Storage and Supply Activity Operation.

2. AMCCOM-R 10-17, Mission and Major Functions of USADACS, 13 January 1986.

C. OBJECTIVE. The purpose of this test was to determine if the toplift frame and strapping configuration of the pallet was sufficient to withstand the rigors associated with EAT prior to flight testing.

D. CONCLUSION. Following successful completion of MIL-STD-209 requirements, the modified STINGER missile pallet was determined to be suitable for helicopter flight testing. The STINGER missile pallet was forwarded to U.S. Army Combat Systems Test Activity (USACSTA) for helicopter flight testing.

PART 2

23 MAY AND 17 JUNE 1994

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## PART 3

### TEST PROCEDURES

As part of the External Aerial Transport (EAT) certification procedure, a static load of 4,200 pounds was applied to the STINGER missile pallet IAW MIL-STD-209. Prior to testing, the 1,200-pound pallet was secured to an M872 semitrailer utilizing two 1-1/4-inch metal bands over the top of the second layer of missile containers (see part 5). A 50,000-pound-capacity container handler was connected to the pallet utilizing a four-legged sling appropriate for helicopter slinging. The pallet was then pulled to the design limit load (3.5 times the pallet weight) for a period of 90 seconds. During the pull, the static load was monitored with a 5,000-pound-capacity dynamometer. Upon completion of the test, the pallet was inspected for damage due to the static load.

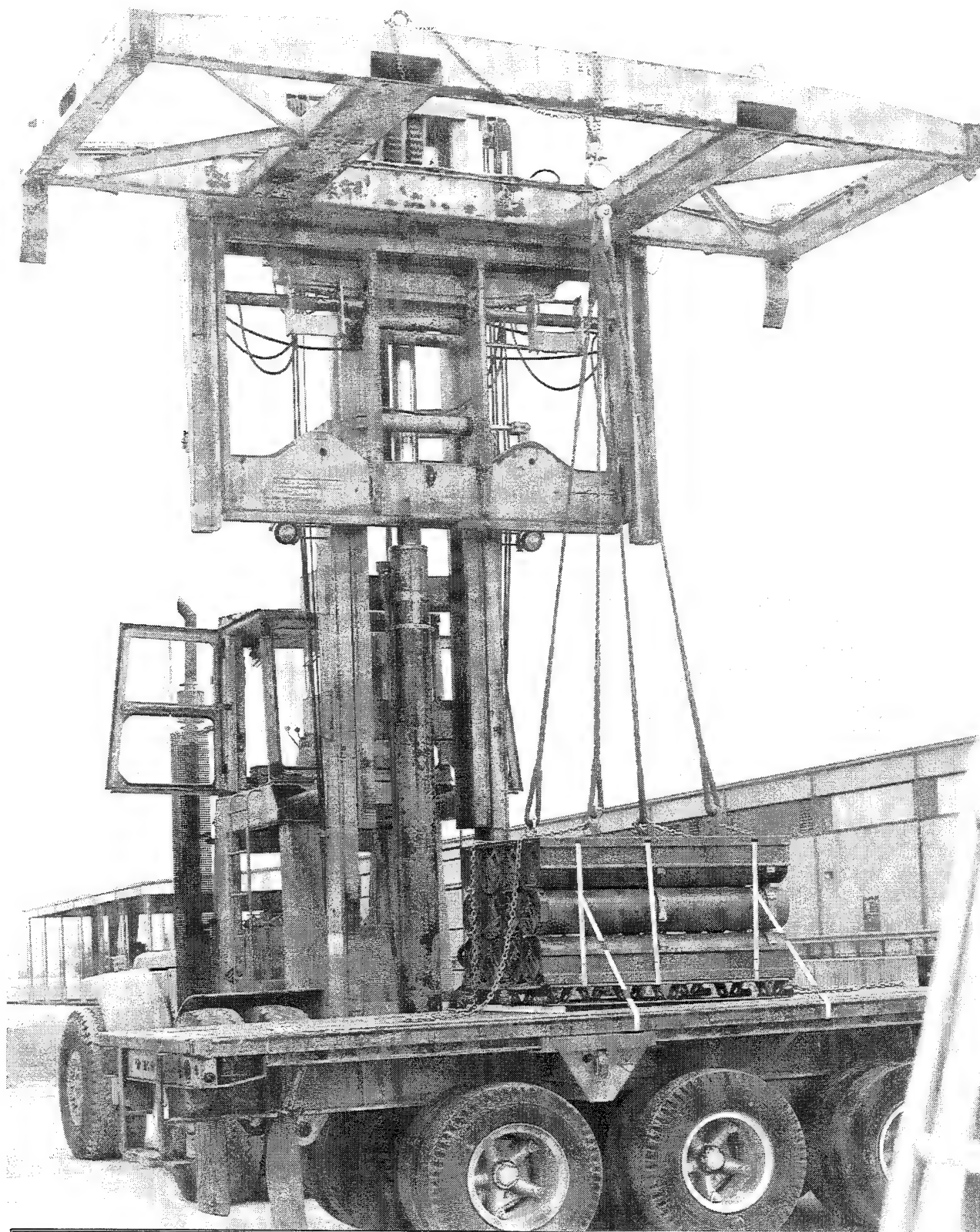
## PART 4

### TEST RESULTS

Upon completion of MIL-STD-209 testing, the STINGER missile pallet was inspected for damage from the static loading. The first article pallet that was initially tested was noted to have minor permanent deformation in the toplift frame. Since no permanent deformation is allowed, the first article pallet was determined to have failed the MIL-STD-209 static pull test. A second pallet toplift frame was then constructed substituting 10 gauge metal for 12 gauge metal. The lift test was repeated with the new toplift frame on the pallet. Upon completion of this test, the pallet was inspected and determined to have sustained no permanent deformation as a result of the static load. Metal strapping used to unitize the pallet was also determined to have sustained no damage as a result of the static loading.

PART 5

PHOTOGRAPH



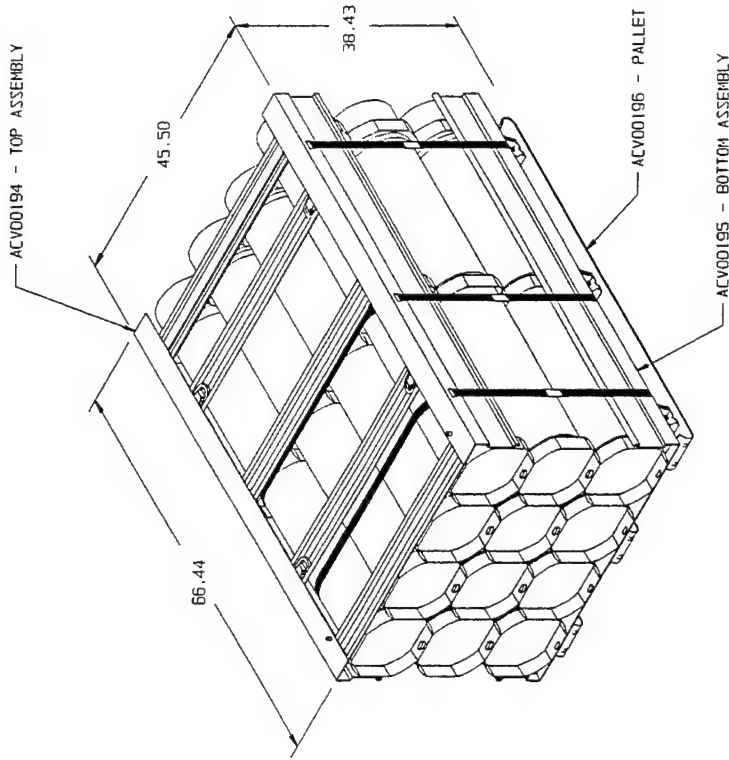
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Photo No. AO317-SCN94-160-2378: This photo shows the STINGER missile pallet attached to the M872 semitrailer during MIL-STD-209 static pull testing.

PART 6

DRAWINGS

REVISION		DATE	APPROVED
LIB	DESCRIPTION		
-	PRODUCT BASELINE ERR H302000	93-04-20	



COMBINATION OF ADOPTED ITEMS	PART NO
PALLET - SPECIAL SIZE 66.44 X 45.50 SHEET METAL	ACV00195
TOP ASSEMBLY PALLET ADAPTER PA158 CONTAINER	ACV00194
BOTTOM ASSEMBLY PALLET ADAPTER PA158 CONTAINER	ACV00195
UNITIZATION DRAWING	19-48-4231/130

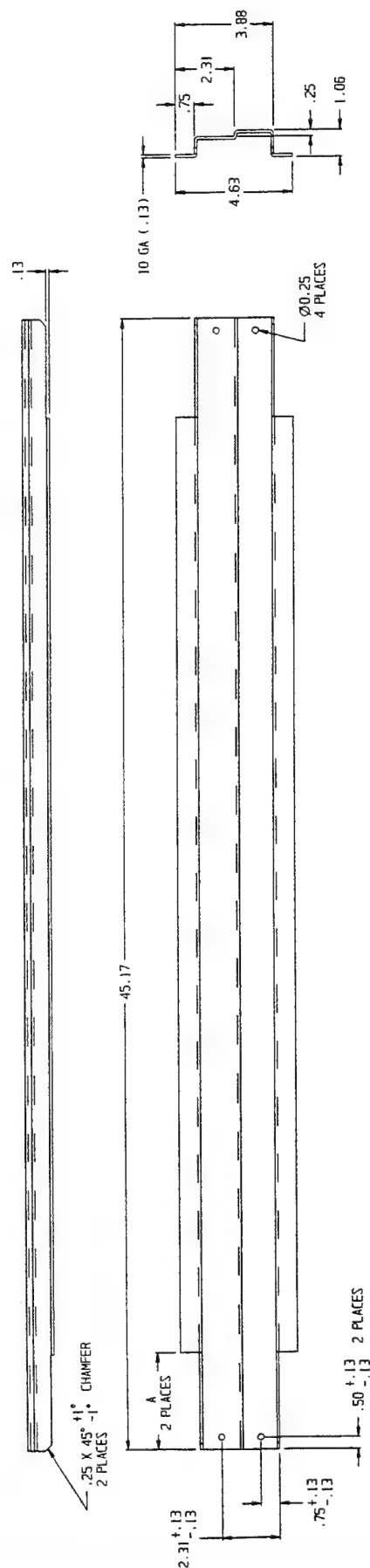
DESIGN ACTIVITY U.S. ARMY ARMED FORCES AND OVERSEAS COMMAND ENGINEERING SIVANA, ILLINOIS 61704-9039	
DATE: 93-04-20 BY: BJK CHECKED: SHS DESIGNED: SCHULTZ	SCALE: 1/8" = 1'-0" UNIT: IN
COMBINATION OF ADOPTED ITEMS, PALLET AND PALLET ADAPTER, UNITIZATION OF PA158 CONTAINER	
SIZE: D CASE CODE: 28620	ACV00193
SHEET 1 OF 1	







- NOTES:
1. BEND RADIUS 0.13 INCH MAX WHERE NOT NOTED.
  2. SPEC ANSI Y14.5M-1982 APPLIES.
  3. MATERIAL: SHEET, SAE OR ANSI 1005-1010 STEEL, CARBON, COLD ROLL OR HOT ROLL, PER ASTM A568, (ASTM A366 OR A569).



DIMENSION	
PART NO	A
ACV00191-1	3.90
ACV00191-2	5.40

PART NO SEE TABLE

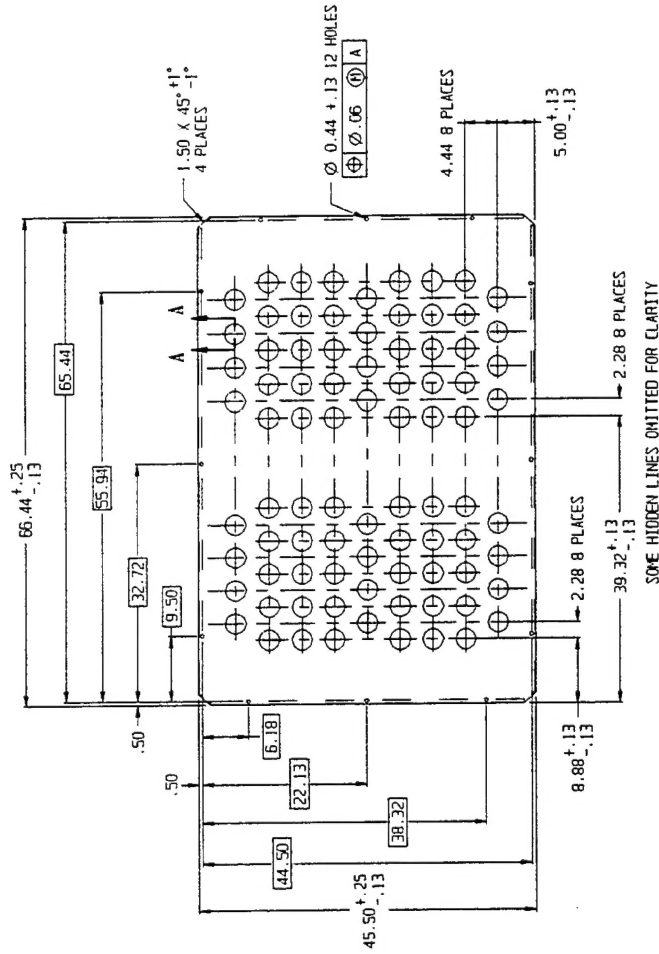
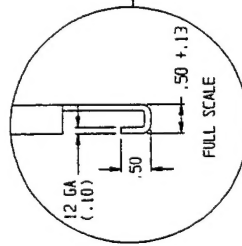
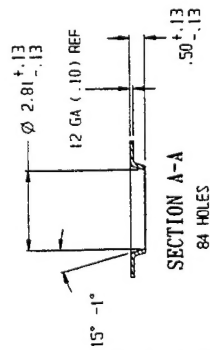
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BY	B.J.K. SMS	CHECKED	
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2" - 4"		.125" - .250"	
4" - 6"		.250" - .500"	
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12" - 24"		1.000" - 2.000"	
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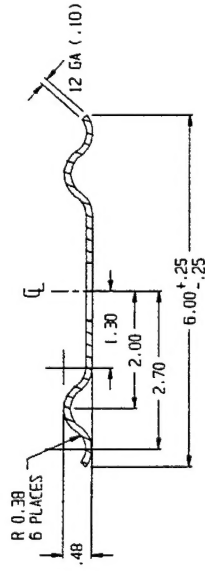
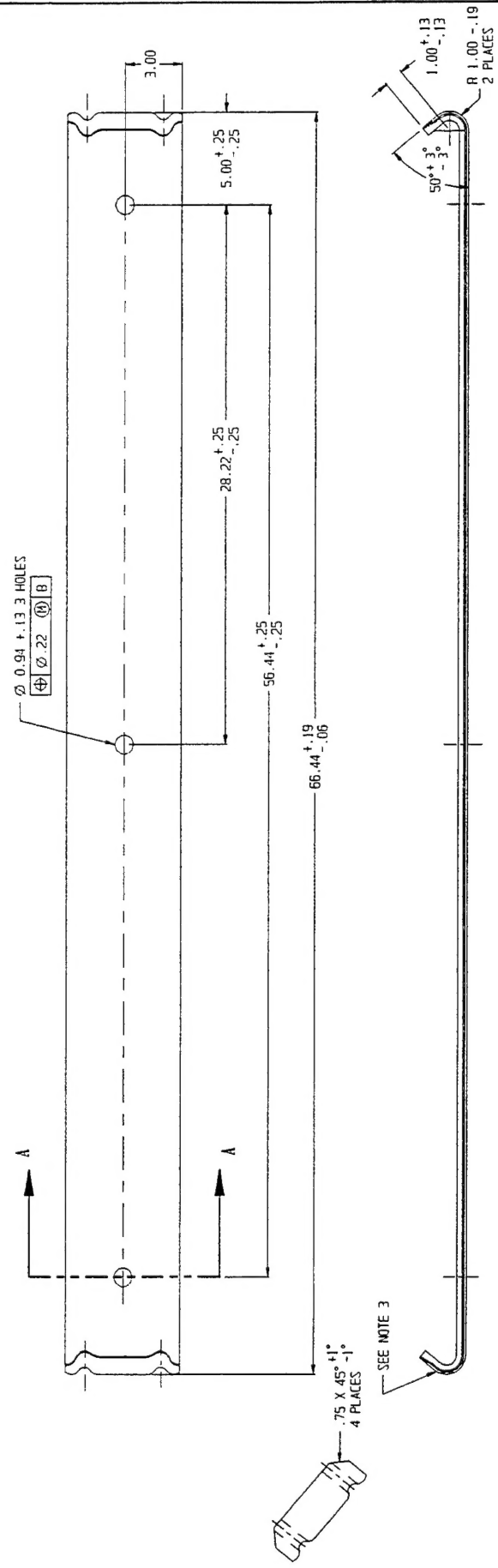
- NOTES:
1. BEND RADIUS 0.13 INCH MAX WHERE NOT NOTED.
  2. SPEC ANSI Y14.5M-1982 APPLIES.
  3. MATERIAL: SHEET, SAE OR ANSI 1005-1010 STEEL, CARBON, COLD ROLL OR HOT ROLL, PER ASTM A568, (ASTM A366 OR A569).



PART NO ACV00197

DESIGN ACTIVITY		93-04-20		DATE		93-04-20		DESIGN ACTIVITY		U.S. ARMY ENGINEERING CENTER SANDHIA, TULLAH, MISSISSIPPI 38916-1299	
DESIGNER		CHKD BY		DESIGNER		CHKD BY		DESIGNER		U.S. ARMY ENGINEERING CENTER SANDHIA, TULLAH, MISSISSIPPI 38916-1299	
DECK - PALLET		BJK		SHS		SHS		DECK - PALLET		U.S. ARMY ENGINEERING CENTER SANDHIA, TULLAH, MISSISSIPPI 38916-1299	
ACV00197		STINGER		TEXT ASSY		USED IN		ACV00197		U.S. ARMY ENGINEERING CENTER SANDHIA, TULLAH, MISSISSIPPI 38916-1299	
SCALE 1/8"		UNIT WT		SHEET 1 OF 1		SHEET 1 OF 1		SCALE 1/8"		UNIT WT	
SHEET 1 OF 1		SHEET 1 OF 1		SHEET 1 OF 1		SHEET 1 OF 1		SHEET 1 OF 1		SHEET 1 OF 1	

- NOTES:
1. SPEC ANSI Y14.5-1982M APPLIES.
  2. MATERIAL: SHEET, SAE OR ANSI 1005-1010 STEEL, CARBON, COLD ROLL OR HOT ROLL, PER ASTM A568 (ASTM A366 OR A569).
  3. DISTORTION IN THE BEND IS PERMISSIBLE.



SECTION A-A  
SCALE 1/1

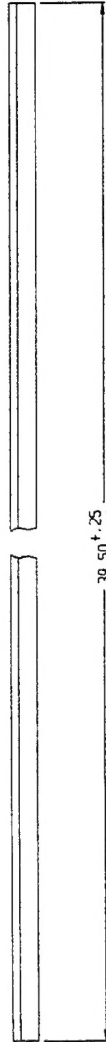
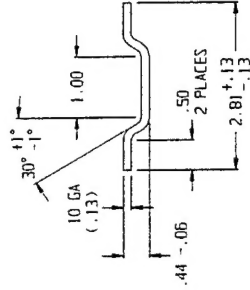
PART NO ACV00198

REVISION		DATE	APPROVED
1	PRODUCT BASELINE	93-04-20	
2	ERR H3D2000	93-04-20	

DESIGN ACTIVITY	U.S. ARMY
APPROPRIATE, MAINTENANCE AND OPERATIONAL CONSIDERATIONS	ARMY, ARMY ENGINEERING CENTER, FORT MONROE, VIRGINIA, 22060-5000
DESIGNER	BJK SMS SCHULTZ
CHECKED	
TESTED	
APPROVED	
DATE	93-04-20
BY	BJK SMS SCHULTZ
FOR	DESIGN, EVALUATION, AND CONSTRUCTION
PROJECT	ACV00198
DESCRIPTION	SKID PALLET, SHEET METAL
SIZE	D 28820
SCALE	3/8
SHEET	1 OF 1

- NOTES:
1. BEND RADIUS 0.13 INCH MAX WHERE NOT NOTED.
  2. SPEC ANSI Y14.5-1982M APPLIES.
  3. MATERIAL: SHEET, SAE OR ANSI 1005-1010 STEEL, CARBON, COLD ROLL OR HOT ROLL, PER ASTM A568, (ASTM A366 OR A569).



PART NO ACV00199

DESIGN ACTIVITY		U.S. ARMY ARMED SERVICES CENTER RESEARCH AND DEVELOPMENT CENTER SILVERDALE, ILLINOIS 61084-9009	
DATE	93-04-20	DESIGNER	BJK SMS SCHULTZ
BY	BJK SMS SCHULTZ	TEST TECH	TEST TECH
TEST TECH	TEST TECH	COMP. EVALUATION	COMP. EVALUATION
MATERIAL		MATERIAL	
ACV00199		STIFFENER	
NEXT ASSY		USED ON	
APPLICATION		APPLICATION	
SIZE		D 28820	
SCALE		1/1	
UNIT		IN	
SHEET		1 OF 1	